A Study of Some Factors Related to Damage to Corn in Alabama by the Rice Weevil, *Sitophilus oryza* (L.)

BY

WILLIAM GIBBS EDEN

B.S., Alabama Polytechnic Institute, 1940
M.S., Alabama Polytechnic Institute, 1947

AN ABSTRACT OF A THESIS

Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Entomology
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A STUDY OF SOME FACTORS RELATED TO DAMAGE TO CORN IN ALABAMA BY THE RICE WEEVIL, *SITOPHILUS ORYZA* (L.)

Introduction

A two-year study was made at the Agricultural Experiment Station of the Alabama Polytechnic Institute of the effects of nine factors on rice weevil damage to corn in Alabama. These factors were as follows: (1) husk coverage; (2) entrance into ears by the corn earworm and fall army worm; (3) date of planting; (4) hardness of the kernel; (5) thickness of the kernel pericarp; (6) drill spacing; (7) irrigation; (8) fertilization; and (9) length of time required for maturity.

Summary

Husk coverage was highly related to rice weevil damage. A husk-cover rating chart was prepared; it entailed five degrees of husk cover as follows: 1 – very poor; 2 – poor; 3 – fair; 4 – good; and 5 – very good. When this rating chart was applied to 20 different varieties of corn, it was found that an increase of one increment in husk cover decreased weevil damage at harvest by 23.5 per cent.

Entrance into the ears of two varieties of corn by the corn earworm and fall armyworm caused an average increase in weevil damage of 33.2 per cent at harvest time.

In a study of five varieties of corn planted at seven different dates, it was found that, in general, the later the corn was planted, the less weevil damage occurred.

Harder varieties of corn suffered less weevil damage than softer varieties. On the basis of pounds of pressure required to penetrate the kernels with a 1/16-inch hollow punch, an increase of one pound of pressure decreased weevil damage by approximately one per cent in a study of twenty different varieties of corn. In the same twenty varieties the thicknesses

of the kernel pericarps were not significantly related to the amount of rice weevil damage.

The drill spacing of corn was significantly related to weevil damage. In general, the more plants there were per acre, the less was the rice weevil damage.

Irrigation had no significant effect on the amount of rice weevil damage to corn.

Phosphatic and potassium fertilizations of corn were not significantly related to weevil damage, but increases in nitrogenous fertilization caused increases in weevil damage.

In a study of 29 varieties of corn, the length of time required for maturity was inversely proportional to the rice weevil damage.

VITA

William Gibbs Eden was born in Talladega County, Alabama, on May 3, 1918. After completing his elementary and high school education in the public schools of St. Clair County, Alabama, he was awarded the B.S. degree in Agriculture at Alabama Polytechnic Institute in May, 1940. Following his marriage to Miss Evelyn Smith of Acmar, Alabama, on June 1, 1940, he was employed by the Agricultural Extension Service of the Alabama Polytechnic Institute as assistant county farm agent until he entered the U. S. Navy in May, 1944. After he was released from active naval service in May, 1946, he received his M.S. degree in entomology at the Alabama Polytechnic Institute in June, 1947, immediately after which he enrolled as a graduate student in pursuit of the doctor's degree at the University of Illinois. Following one year's graduate work as research assistant he was granted permission to complete his work *in absentia* at the Alabama Polytechnic Institute. Since June 15, 1948, he has been employed as assistant entomologist with the Agricultural Experiment Station of the Alabama Polytechnic Institute.

He is a member of Phi Kappa Phi, Gamma Sigma Delta, and Sigma Xi honorary fraternities and is an active member of the American Association of Economic Entomologists. He has two daughters: Brenda Ann, 9 years old; Evelyn Jane, 4 years old.

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